



Summary of Findings

March 2007 TMDL/Monitoring National Workshop Session on Program Effectiveness

As part of a national meeting that had assembled regional and national headquarters leaders and staff from the USEPA TMDL program and Monitoring program, we convened a session on brainstorming about program effectiveness, gaps, and possible solutions. The goal of the Program Effectiveness session was to increase regional/HQ dialogue and awareness about measuring and improving effectiveness in our national TMDL, monitoring and NPS programs. The breakout session asked eight tables of mixed participants to ponder the same question:

What information would most help our efforts to demonstrate and improve our program effectiveness, and how should we go about getting it?

Raw notes from all eight tables were collected and sorted by general themes of suggestions made (for the full list of individual suggestions, see Appendix). The objective of analyzing and reorganizing these suggestions was a) to verify general themes and widely held opinions of actions we should take, and b) also make note of any new or innovative ideas. This summary addresses this by identifying five themes and their sub-themes (see Table 1), and describing the basic messages from each major theme in narrative form, while also adding a list of innovative ideas.

Table 1: Common themes and sub-themes of program effectiveness suggestions made at 2007 National Workshop

| General Theme/subtheme | # of suggestions | % of suggestions |
|---|-------------------------|-------------------------|
| I. DATA NEEDS <ul style="list-style-type: none">• increasing documentation/improving quality• monitoring data on envir. condition• monitoring data on post-activity (e.g. TMDL)• program tracking | 85 | 33% |
| II. COLLABORATION AND COMMUNICATION <ul style="list-style-type: none">• integration, collaboration and leveraging resources• turning data into information/communication | 50 | 20% |
| III. PROCESS EFFICIENCIES <ul style="list-style-type: none">• priority setting• driving factors, increasing restoration success• info systems, software, and tools | 47 | 19% |
| IV. ANALYSIS <ul style="list-style-type: none">• effectiveness analysis• goals, indicators, and measures• assessment designs | 46 | 18% |
| V. ACTIONS AND IMPLEMENTATION <ul style="list-style-type: none">• implementation of activities | 26 | 10% |
| TOTAL SUGGESTIONS (INCLUDES REPEATS) | 254 | 100% |

I. Suggestions on Data Needs were 33% of the feedback and the largest theme overall, emphasizing the importance of data availability and quality to understanding and improving effectiveness. Main points raised about **increasing documentation/improving quality** included: needing quality data on accurate 303(d) lists, TMDLs done, and TMDLs implemented; good QA/QC including for 3rd party data; more effectiveness data showing environmental outcomes of actions; streamlined procedures and more timely submittals; and more data access to USDA/EQIP, LID practices, and TMDL-linked permits. Suggestions on **monitoring data about environmental condition** were: use probabilistic designs; meet program needs with targeted and ambient monitoring; data, data, data needs \$\$\$; take the load off states; and be strategic in deciding what scope of monitoring to support. Thoughts about **monitoring data on post-activity (e.g. post-TMDL results)** were numerous and included: need more success stories, case studies, full restorations with WQS met; need data on water quality improvements, interim progress, reduced causes, as different from full recoveries; upgrade support for effectiveness monitoring as it competes with ambient; use 319 for targeted monitoring; keep monitoring BMP effectiveness; monitor implementation success; and help states with the demand on field personnel and new methods. **Program tracking** data suggestions were: track priority watersheds, other agency programs, violations, decisions; strive for a way to do implementation tracking, GRTS may be a starting point with states because they know it; form a TMDL info tracking group as a follow up; and use funding like carrot-and-stick to increase tracking.

Innovative ideas under this theme included:

- work out something to enable access to USDA data
- iron out 3rd party data QA/QC requirements
- get better data on biological assemblages to document improvements, progress
- use 319 for more targeted monitoring; use GRTS for implem tracking, states know it
- start a TMDL implementation tracking group
- hold funding hostage to get more tracking done

II. Suggestions on Collaboration and Communication made up 20% of the total comments, which points to the crucial roles of **transforming data into easily communicated information** and also **collaboration across programs**, agencies and levels of government. State and regional buy-in was widely seen as essential, but volunteers, universities and private sector were also recognized partners. Funds are the largest looming obstacle but partnering is a common countermeasure. Scales for collaboration included orienting toward various watershed levels; integration on a cross-program or cross-agency basis was also advocated. Again, the driving purpose behind collaboration is efficiency, cost savings, data enhancement, and building critical mass to get things done. Beyond collaboration, a key to communication of technically based information is recognition that data aren't sufficient alone without being reformatted as policy-relevant information; technical information transfer and outreach were seen as valuable activities to increase program effectiveness.

Innovative ideas under this theme included:

- invest more in methods selection and standardization to answer key questions
- getting data to become information is both a technical and communications task
- coalitions for monitoring; volunteers might greatly enhance tracking

III. Suggestions on Process Efficiencies were 19% of the total workshop suggestions, revealing widely held opinions that improvements in effectiveness are possible through priority-setting, improving data systems and tools, and understanding the driving factors that cause certain program results. Thoughts about **priority setting** included: states

should target priority watersheds; base restoration investments on restoration potential; guide implementation with priority-setting; and need tools and info to help set priorities. **Driving factors** that influence success were seen as a worthwhile focus, in particular: socio-economic factors; BMP effectiveness; program traits that help explain success; and the role of champions for specific waters in driving success. Also among process efficiencies were numerous suggestions about **data systems and tools**, such as: continue to streamline data reporting and improve data systems; strongly advocate timely reporting; use GRTS for part of implementation tracking; and modify data systems to accept more improvement/restoration information.

Innovative ideas under this theme included

- seek to shorten specific procedure steps that cause reporting and data delays
- develop tools for priority setting
- monitor where we are likely to find progress
- use NHD+ and landscape data to screen for driving factors that produce success
- examine the SEGEVAL program as automated assessment tool that saves funds
- assess STORET as possible source of incremental improvements data

IV. **Suggestions on Analysis** were 18% of the comments received, indicating that our programs should examine the options for selecting the best goals and measures, sampling designs, and assessment techniques. Comments about **effectiveness analysis** pointed strongly toward enhanced post-project (especially post-TMDL) monitoring, looking at multiple data sources for evidence of progress, BMP-specific tracking and evaluation studies, and clearer strategies about state and EPA effectiveness goals. **Goals, indicators and measures** prompted suggestions that included: start with effectiveness goals and measures that make sense; develop measures of progress, restoration, and protection, including interim progress; baseline concept needs work and improvement; but yet, counter the tendency to let effectiveness goals and analysis become overly complex. **Assessment designs** play key roles in analysis, and suggestions included: improve assessment methods guidance; large watershed probabilistic design methods; advice for states without good baselines.

Innovative ideas under this theme included

- reconsider whether WQS is appropriate first
- develop state strategies to monitor long-term effectiveness from specific baselines
- integrate more with ecoregional concepts in designs and assessments of programs

V. **Suggestions on Actions and Implementation** provided 10% of the workshop feedback; this category differed from all the others in being management practice-oriented rather than information-, process-, or analysis-oriented. Most comments acknowledged both the very high importance of understanding implementation rates and successes as well as the extreme difficulty of universal tracking of all implementation. Despite difficulty, there were no suggestions to avoid implementation tracking. Even reporting that implementation is happening was seen as worthy progress and reason to track activity. Leadership on implementation tracking, however, may need to come from states rather than be imposed by EPA.

Innovative ideas under this theme included

- study sampling approaches to tracking and estimating implementation
- consider whether implementation is more valuable than monitoring, with \$ limits
- avoid regulatory drivers/requirements approach to implementation tracking

Contact: Douglas J. Norton, Watershed Branch AWPD norton.douglas@epa.gov

Appendix: Raw breakout session notes aggregated into topics/subtopics

| Topically grouped suggestions from Monitoring and TMDL National Workshop breakout session on what would most improve program effectiveness. The five main categories are Data Needs, Process Efficiencies, Collaboration & Communication, Actions & Implementation, and Analysis. | |
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| THEMES/subthemes/individual suggestions | # of mentions |
| I. SUGGESTIONS ON DATA NEEDS | 85 |
| increasing documentation/improving quality <ul style="list-style-type: none"> effectiveness info: NHD+, landscape info, WATERS more scientific research tracking- priority watersheds, data, other agency/programs, decisions, violations, communication how real is the 303d list? 1st step must be done correctly to complete next steps of TMDLs and implementation temporal and spatial scale accuracy and representation for creating the list ID'ing permits including elements of TMDL implementation plan lack of info or data that tells us whether TMDLs are making progress – was the TMDL effective second the above from Monitoring perspective NEED USDA data e.g. EQIP shared with EPA and states – work something out somehow. One rancher cannot get the data for his own ranch even. LID practices not really being tracked but could be real relevant to results more timely data submittal of complete and accurate data would do wonders most useful: # TMDLs developed # TMDLs being implemented # impairments on 303d list, nationally counted the same way correct waters listed for right reasons, need an accurate baseline % of state waters correctly monitored need data that are adequately QA/QCed 3rd party data acceptance that meets QA/QC account for monitoring changes strategically compile % of blended TMDL waters to work on shorten procedures that cause report delays and data delays (e.g. 2002 report stalled at OMB now) more timely data submittal of complete and accurate data would do wonders know how real our 303d lists are: temporal/spatial accuracy, representation at state scale, ensure assessment and listing methods are updated for current conditions; suggest ecoregional approach accuracy of standards/listing | (25) |
| monitoring data on envir. condition <ul style="list-style-type: none"> bridge monitoring programs – probabilistic, targeted, ambient – to meet program needs flow information stormwater violations tracking biological assemblage changes info data for different uses – for implementation, for checking progress targeted monitoring for TMDLs etc competes for attention and resources with prob monitoring need suitable monitoring data | (15) |

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| <ul style="list-style-type: none"> • data data data/ needs \$\$\$/ needs aggressive support from mgt and decision makers • balance the probabilistic with site specific monitoring • use probabilistic monitoring • take the load off states for monitoring • 30% monitor in-situ – WQ data are still important • decide what scope of monitoring to support: once we have that, populate storet, see improvement over time, see progress in case studies • monitoring worth 30% of investment • be strategic about controls and how often to monitor | |
| <p>monitoring data on post-activity (e.g. TMDL)</p> <ul style="list-style-type: none"> • Data on water quality improvements • Waters restored with WQS met • bridge monitoring programs – probabilistic, targeted, ambient – to meet program needs • every action to have a follow up monitoring • compliance e.g. urban stormwater permits • how well implemented and maintained • interim progress between what's on and off the list. how do we get credit? how do we know we're making progress? • what baseline will you compare post TMDL effects to? • progress in WQ towards attainment • biological assemblage changes info • upgrade significance of effectiveness monitoring • monitoring implementation success • lack of info or data that tells us whether TMDLs are making progress – was the TMDL effective • second the above from Monitoring perspective • data for different uses – for implementation, for checking progress • lack of field personnel to change monitoring tactics to match the goals of a TMDL (TMDL target not equal to monitoring measure not equal to WQ criterion) change perspective once a TMDL is created • targeted monitoring for TMDLs etc competes for attention and resources with prob monitoring • monitoring cutbacks should be avoided at all costs or you pay later with the unknowns you cannot know (Rummy). • need suitable monitoring data • data data data/ needs \$\$\$/ needs aggressive support from mgt and decision makers • use 319 for more targeted monitoring • balance the probabilistic with site specific monitoring • reductions in pollutants, restoration of uses tracked and accounted for • interim progress milestones e.g. improve WQ • can we find more success stories • are we monitoring post-implementation to show improvements? case studies role • restoration monitoring \$\$ in particular • how many BMPs have been implemented? • monitoring of BMP effectiveness, go to state to do the long term monitoring 5 to 10 year rotation • take the load off states for monitoring • decide what scope of monitoring to support: once we have that, populate storet, see improvement over time, see progress in case studies • get data that show if WQ is improved, standards attained. • follow-up monitoring to make sure we learn • monitoring worth 30% of investment | (35) |

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| <ul style="list-style-type: none"> • be strategic about controls and how often to monitor | |
| program tracking <ul style="list-style-type: none"> • tracking/interaction/diff programs • tracking data – leveraging data • track other agency funds/programs • tracking- priority watersheds, data, other agency/programs, decisions, violations, communication • tracking • strategies to cheaper implem and tracking of progress • implem tracking: needed for PS, NPS – GRTS may be a point to start with because states are familiar and use it • incentives to track and report more: hold the funding hostage like a carrot and stick, we are not doing this as often as we could. • should be a TMDL info tracking group as a follow up • implementation and tracking worth 70% of investment | (10) |
| II. SUGGESTIONS ON COLLABORATION & COMMUNICATION | 50 |
| integration, collaboration and leveraging resources <ul style="list-style-type: none"> • Collaboration across programs • State and regional buy-in • add more third party data: volunteers, universities, private sector • watershed planning groups • volunteer groups • applications increasing but \$\$ decreasing • integration at the watershed level – realistic expectations • get states to kick in resources • track other agency funds/programs • systematic approach to implementation, monitoring and tracking • as we don't have the resources for implementation, leverage/communicate success, snowball effect • EPA is a bit player with \$\$ • all of the above take resources -- \$\$\$\$!! • volunteer mon orgs to help track • collaboration/coordination • Volunteer monitors want their data used, with proper quality controls • how to get the info -- \$\$\$\$ are the biggest obstacle • need help in integration at regional level: methods standardization and comparability; sampling designs; optimizing the use of outside ("found") data; state independence tends to run counter to this. • coalition monitoring: more unified plans would result in more efficient data sharing, common methods, etc. • NEED USDA data e.g. EQIP shared with EPA and states – work something out somehow. One rancher cannot get the data for his own ranch even. • better characterize the integration of 319 and TMDLs – GRTS might be used for this too. • incentives: hold the funding hostage like a carrot and stick, we are not doing this as often as we could. • monitoring cutbacks should be avoided at all costs or you pay later with the unknowns you cannot know (Rummy). • use 319 for more targeted monitoring • leveraging with more groups to get more partnering • monitoring vs implementation – where do we spend our \$\$? • how much \$\$ spent on BMPs, monitoring, looking for response, implementation? | (38) |

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| <ul style="list-style-type: none"> • which is more important, monitoring data or implementation measures? • as a matter of policy be strategic about where \$\$ is spent • but we don't have partners on the board that can make this happen? does the table include all programs – NPDES, Air, etc? • local ordinances need to be right for municipality • what is the long term state strategic plan? • institutionalizing a state level strategic plan • coalitions for monitoring • work with local groups/stewards to promote and champion progress • bring in other groups who collect data • link all actions to monitoring data • collaboration within EPA, outside w/states, local groups | |
| <p>turning data into information/communication</p> <ul style="list-style-type: none"> • actions to data is not tracked well • turning data into information • communication mechanism – monitoring/permits • communicating problems/restoration strategies • cross program communication, monitors and permits • communication cross-program • themes: data to info; tracking info; getting data into storet etc • part of the need is better conversion of data to information (see Cleland example: just data on flow and concentration, or formatted to inform pre-implementation and post-implementation differences and effectiveness) • better demonstration, outreach, tech support on turning data into information needed • disconnects exist between monitoring info requests from managers and what exists, what question it answers. • data into information • turning data into valuable information; translating to something that shows progress | (12) |
| III. SUGGESTIONS ON PROCESS EFFICIENCIES | 47 |
| <p>priority setting</p> <ul style="list-style-type: none"> • implementation focused on priorities • prioritizing: low hanging fruit; 12 digit huc scale • restoration potential • tools and info to help us prioritize • Prioritize • environmental results triage • target priority watersheds • a tool for detecting priority watersheds, waters where mon data would be good to have by 2011. regional state local. • immediate priorities • states need to PRIORITIZE WATERSHEDS • need a tool that communicates what are priority waters for showing results before 2011 | (11) |
| <p>driving factors, increasing restoration success</p> <ul style="list-style-type: none"> • restoration potential • socio-economic factors • BMP effectiveness • watershed – BMP variable success – here it did 20% there 60% • restoration potential • socio-economic factors • BMPs as fundamental building block • installation and maintenance | (22) |

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| <ul style="list-style-type: none"> • keep BMP at state/fed level • easy ones are done at this point • next stage: larger underlying risks, more complex, changing measures • low impact development • ID'ing what about a program produces improvements and how that can be transferred to regions and states • implementation of control measures to improve WQ; ID'ing elements of implementation to focus on as measures of success • for more rural areas focus on places where TMDL implem would be less different w/higher prob of success in relatively short period. • improvements: NPDES; nonurban, voluntary, state champions for waters • ID'ing what about a program produces improvements and how that can be transferred to regions and states • presence of local champions for improving WQ • lack of full knowledge about what programs can do to meet TMDL goals • how to get the info -- \$\$\$\$ are the biggest obstacle • NHD+ landscape characterization to analyze causes for outcomes • get data for different uses – for implementation, for checking progress | |
| <p>info systems, software, and tools</p> <ul style="list-style-type: none"> • streamline data reporting – look for efficiencies, automated processes (see Arkansas example) • ADB – assessment results • STORET – incremental progress data? • resources – info tracking system • automated assessments to make listing decisions, free up thousands of hours from this. R6 developed SEGEVAL program to assessmon data collected. can be done in other states with R6 help. • benefits of auto assessments: takes 5 min to assess1 station with mon data; generates report IDing uses and criteriawhich are not being met; info would be put into ADB; currently working on updating SEGEVAL to populate ADB with decisions; takes bias out of listing decisions; streamlines EPA review process; frees up state time; TX, OK, AK showing interest; more info contact Jessica Franks 214-665-8335 • need to find a way to get this info to other states and possibly HQ . • implem tracking: needed for PS, NPS – GRTS may be a point to start with because states are familiar and use it • modify the data systems to accommodate improvements info: what fields? whose responsibility? who inspects what data? • have benchmark or rules for inputs to storet • baseline data in STORET—is it changing over time? source of progress info? • re: databases need to be able to support short turnaround info requests so timely submissions and data input would help • decide what scope of monitoring to support: once we have that, populate storet, see improvement over time, see progress in case studies • use of databases: NHD will be useful, ADB, STORET: track improvements to learn what works | (14) |
| <p>IV. SUGGESTIONS ON ANALYSIS</p> | 46 |
| <p>effectiveness analysis</p> <ul style="list-style-type: none"> • Investment in effectiveness monitoring • Sustained and evaluated implementation • bridge monitoring programs – probabilistic, targeted, ambient – to meet program needs • effectiveness info: NHD+, landscape info, WATERS • effectiveness monitoring at state level using 319 money instead of project | (13) |

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| <p>level – long term strategic plan/targeting/baselines</p> <ul style="list-style-type: none"> • specific tracking of sources and BMPs so that you can measure their effectiveness (e.g. NPS stressors in watershed in R4 IDed and referenced) • upgrade significance of effectiveness monitoring • lack of info or data that tells us whether TMDLs are making progress – was the TMDL effective • second the above from Monitoring perspective • is 'effectiveness' implementing VS results on the ground? • are WQS appropriate first • effectiveness monitoring at state level accomplished by having long term strategies include monitoring to track progress; institutionalize in states; establish baselines as part of this • need efficiency – we've made this complex | |
| <p>goals, indicators, and measures</p> <ul style="list-style-type: none"> • Effectiveness goals that make sense • Measures of restoration • Measures of progress • Measures of protection • Include interim measures • add stream miles restored to strategic measures • baby steps – 12 digit huc, measure W • track not temp but shade? • no baselines! • systematic way of establishing baselines • natl scale, better stds for sediment and nutrients • focusing on uses – great to have data in ADB, but keep reality check • WQS appropriate/updated for current conditions/population/development (e.g. LA, TX WQS inappropriate but still using) • ecoregion approach to uses and WQS • resources should be targeted in wshed plans to achieve measures and strategic targets • existing measures are sometimes minimally relevant – keep examining how much or little sense they make. trouble with how sensible some measures seem at the local level or state level. • eliminate self-competing or contradicting aspects of measures, unintended effects. • need appropriate measures that make sense • most useful: # TMDLs developed • # TMDLs being implemented • # impairments on 303d list, nationally counted the same way • correct waters listed for right reasons, need an accurate baseline • % of state waters correctly monitored • reductions in pollutants, restoration of uses tracked and accounted for • measure interim progress: what's on/off list | (25) |
| <p>assessment designs</p> <ul style="list-style-type: none"> • large watershed probabilistic design measure • systematic way of establishing baselines • state scale assessment and listing methods • can special monitoring/sampling designs efficiently address the TMDL questions, as well as special designs address the ambient condition questions? • need good assessment methodologies not inconsistent ones • some states just getting started on data collection, so no baseline yet – need to know how to interpret • investigate how probabilistic mon can help or leverage site-specific info • at state scale, ensure assessment and listing methods are updated for | (8) |

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| current conditions; suggest ecoregional approach | |
| V. SUGGESTIONS ON ACTIONS & IMPLEMENTATION | 26 |
| implementation of activities <ul style="list-style-type: none"> • Investment in implementation • creating TMDL implementation group • finer scale first then watershed • no regulatory drivers • making sure implementable by states without too much resource burden • implementation of control measures to improve WQ; ID'ing elements of implementation to focus on as measures of success • implementation components so measures dont get coarse • getting better info out: provide more details to states on writing implementation plans, what options for PS and NPS control are available to them • strategies to cheaper implem and tracking of progress • # TMDLs being implemented • analyze implementation, both initiation and progress/completion • where is implementation happening? • what monitoring is tracking implementation? • how many BMPs have been implemented? • EPA not in charge of implementation – what can expectation be for us to track? important to know what is being implemented somewhere – need monitoring for this • measuring implementation – maybe more important than monitoring, report to public that we are implementing • leadership at states needs to begin implementation at their level, more important than measurement • impl takes time, expect results longer term • how do we know what BMPs are effective? 50% implement, 50% measure? • BMPs should work and should already be proven. local groups may not know how to install effectively • local implementation does not always track to state priorities • some states like FL are more focused on implementation and do not always write TMDLs. others write TMDLs, no action (can we fairly characterize each per state?) • barriers: tracking implementation, tracking response • 70% what is being implemented -- # of implementation actions • provide more details to TMDL implem plans • implementation and tracking worth 70% of investment | (26) |
| TOTAL SUGGESTIONS IN ALL CATEGORIES (INCLUDES REPEATS) I. DATA NEEDS II. COLLABORATION AND COMMUNICATION III. PROCESS EFFICIENCIES IV. ANALYSIS V. ACTIONS AND IMPLEMENTATION | 254 (100%) 33% 20% 19% 18% 10% |